

# A Case Report of Adult Croup: A New Old Problem

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## Abstract

*Laryngotracheobronchitis is a common disease of childhood most often associated with infection by parainfluenza virus. Although rare, adult cases have been reported. Adult croup presents similarly to the childhood version; however, the severity is usually much worse, often leading to hospitalization. Presented is the case of an 80-year-old woman with croup, which is the twelfth reported in the English literature.*

## Introduction

Croup (laryngotracheobronchitis) is a common childhood disease with a peak incidence at 12-24 months of age that is often mild and managed on an outpatient basis.<sup>1</sup> Patients usually present with a barking cough, stridor, hoarseness with a prodrome of an upper respiratory infection. Radiographic and laryngoscopic examinations often show subglottic narrowing, the steeple sign.<sup>2</sup> The most common etiology in children is viral (e.g. parainfluenza and influenza) but bacterial origin has also been noted (*M. pneumoniae*, *C. diphtheriae*, and *S. pneumoniae*).<sup>1,3</sup> Adult croup is more serious, often requiring hospitalization. It has been defined as a "community acquired acute laryngotracheitis in adult patients who are otherwise healthy."<sup>3</sup> Possible etiologies include Herpes simplex, Cytomegalovirus, Influenza type B, *S. aureus*, *H. Influenza*, and aspergillosis fumigatus.<sup>3</sup> To our knowledge only 11 cases have been reported in the English literature.

## Case Report

An 80-year-old Japanese female non-smoker without a history of respiratory disease presented with a three-day history of rhinorrhea, sore throat, dysphagia, tachycardia and cough productive of yellow-green mucous. She denies fever, chills and shortness of breath. On physical examination, she had a blood pressure of 174/86, pulse of 100 bpm, respiratory rate of 24, temperature of 37.6 °C, and an O2 saturation of 92% on room air. The lungs were clear on percussion but auscultation revealed diffuse coarse rhonchi. The pharynx was clean. X-ray of the neck revealed a narrowed subglottic area and flexible laryngoscopy found yellowish secretions in the hypopharynx with some covering of the vocal cords (see Figure 1). After suctioning, the vocal cords were mildly erythematous.



Figure 1

Subglottic edema was also present and yellowish pus coated some of the trachea. Her labs showed a WBC count of  $9.4 \times 10^3$  cells/ $\mu$ L with a bandemia of 54%. Her initial diagnosis was acute laryngotracheitis of bacterial origin and was treated with Rocephin, humidified air and Cepacol lozenges. Epinephrine and glucocorticoids were not needed for airway management.

Over the next three days, the patient's sore throat and cough resolved and her WBC count dropped to  $4.6 \times 10^3$  cells/ $\mu$ L with a left shift of 21% bands on the day of discharge. She was afebrile throughout her hospitalization. Blood cultures were negative and sputum found normal flora. Viral titers were not taken. She was discharged on day 4 on Cefaclor. CBC with differential 5 days post discharge showed normal WBC count with resolution of the left shift. Follow up neck x-ray eight days after discharge was normal.

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## Discussion

To our knowledge, 11 cases of adult croup have been presented in the English literature. All have reported the classic symptoms of cough and subglottic narrowing. The majority of cases have also reported an initial 2-4 days of prodrome including upper respiratory tract infection, breath sounds consistent with airway obstruction (e.g. stridor, coarse rhonchi), and some degree of shortness of breath. This is consistent with the definition proposed by Tong *et al.* of adult croup being a community acquired acute laryngotracheitis in adult patients who are otherwise healthy. Most patients remain either afebrile or had mild fevers with temperatures staying in the range of 37-38.5°C. WBC counts ranged from 4,500-19,000 with an approximate average of 11,000. Kozielski *et al.* noted that most patients have a sudden decline in "clinical stability" a few days after experiencing initial symptoms. Half of these patients require intubation or tracheostomy to maintain airways.<sup>4</sup> In most previous reports, flexible laryngoscopy and AP neck x-rays have been the methods of choice for determining the degree of airway obstruction. Because the steeple sign is possible in other etiologies, flexible laryngoscopy, which can visualize erythematous subglottic tissues and varying degrees of exudates covering the airway mucosa, is often performed to confirm the diagnosis.<sup>5</sup>

The differential for subglottic narrowing includes post long-term intubation and chronic diseases including sarcoidosis, amyloidosis and Wegener's granulomatosis.<sup>6</sup> These can be easily excluded by history. Common pathogens that cause croup in children, such as parainfluenza virus, are generally not seen in immunocompetent adults due to immunity acquired in childhood. However, other pathogens such as: Herpes simplex, Cytomegalovirus, Influenza type B, *S. aureus*, *H. Influenza*, and aspergillosis fumigatus probably cause croup in a similar manner to that seen in children.<sup>3</sup>

The pathophysiology of croup is hypothesized to start with viral infection since the majority of croup seen in children is of viral origin. Viruses are spread via aerosol and infect mucosal cells of the nasopharynx. They then spread via lysis of infected cells towards the trachea.<sup>3</sup> The release of inflammatory factors will induce swelling, erythema, and exudation, leading to stridor, cough, and subglottic narrowing. The degree of severity of disease will depend on the response of the host's airway to infection.<sup>4</sup>

At 80 years of age, our patient is the oldest reported case of adult croup in the English literature. Our patient was also found to have yellowish secretions in the hypopharynx with partial covering of the vocal cords. Culture of the sputum was positive for normal flora. Her initial strong bandemia of 54% and subsequent drop in WBC count and bandemia with Rocephin, are suggestive of bacterial infection. The relatively decreased severity of symptoms in our patient is possibly due a blunted inflammatory response commonly seen in patients of advanced age. It is also possible that her use of Vioxx, an anti-inflammatory agent, for an unrelated problem further moderated the severity of her response. Successful treatment appears to revolve around humidified air, anti-inflammatory agents, and rapid administration of antibiotics.

We recognize that viral titers would be useful for determining etiology, but is not standard practice to do titers since the episode is generally resolved by the time the results are available. Our patient, as well as most reported patients with adult croup, did not have a viral titer performed.

## Conclusion

Adult croup is a rare disease that leads to inflammation of the subglottic space. Identification of etiologic pathogens is still tentative. Accurate diagnosis is especially important in adult croup since it is often not considered and can lead to potentially life threatening airway obstruction. This paper adds another example to the literature.

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